

EXECUTIVE SUMMARY

A numerical model, used to predict the long term fate of sediments (LTFATE), was applied to assess the potential stability of sediment caps at the Portland Disposal Site, Maine. The modeling was performed by the Coastal and Hydraulics Laboratory of the U.S. Army Corps of Engineers, Waterways Experiment Station for the New England District.

The results showed that a cap of 50-100 cm thick, composed of sediments similar to those used in the model, would provide protection for the capped sediments even under extreme wave conditions of 14.8 m (48 ft). Using conservative parameters, the model predicted erosion from such waves might remove 11-22 cm of a cap. Thus, capped sediments (under a 50-100 cm cap) are not likely to be at risk of erosion and would remain within the disposal mound.

Depending on the characteristics of the sediments chosen as cap material, actual site losses could be significantly lower than model estimates. Therefore, once a sediment is chosen for cap material, laboratory and field experiments should be performed to determine the erosion potential for these sediments. In addition, further monitoring of the PDS to measure on- and off-site sediment concentrations, bottom roughness, and near bottom hydrodynamics would increase model accuracy. Other factors not accounted for in this modeling effort, such as estimates of sediments transported to and possibly deposited at the PDS, would tend to further reduce the estimate of actual erosion.

Model calibration was accomplished using data provided from a field sampling array that was deployed during events with waves ranging up to 5.4 m (17.7 ft) in height. Severe historical wave conditions were determined through the use of the Wave Information Study (WIS) hindcast for the Atlantic Coast and the ADCIRC ocean circulation model. This included custom refinement of the ADCIRC model grid in the New England region to provide more accurate predictions..